MYCOTAXON

ISSN (print) 0093-4666 (online) 2154-8889 Mycotaxon, Ltd. ©2017

April–June 2017—Volume 132, pp. 299–304

https://doi.org/10.5248/132.299

Xylaria nelumboniformis sp. nov. from tropical China

Hai-xia Ma[1], Larissa Vasilyeva†[2] & Yu Li[3]*

[1] *Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou 571101, China*

[2] *Institute of Biology & Soil Science, Far East Branch of the Russian Academy of Sciences, Vladivostok 690022, Russia*

[3] *Institute of Mycology, Jilin Agricultural University, Changchun 130118, China*

* Correspondence to: *yuli966@126.com*

Abstract—A new pyrenomycetous fungus from the tropical forest of Hainan Province, southern China, *Xylaria nelumboniformis,* is described and illustrated. The new species is characterized by having lotus-leaf shaped fertile stromatal apices, a flattened surface with conspicuously tomentose edges, and navicular to crescent-shaped ascospores (23–27.5 × 7.5–9 µm) with a short oblique germ slit.

Key words—*Ascomycota,* taxonomy, *Xylariaceae*

Introduction

Wood-rotting fungi are an important component of forest ecosystems, where they decompose forest litter and maintain energy flow and material circulation (Lonsdale et al. 2008). Most *Xylaria* species produce stromata on decayed wood (Dennis 1956, Martin 1970, Rogers et al. 1987, Læssøe 1987, Van der Gucht 1995, Ju & Rogers 1999, San Martín et al. 2001, Ju et al. 2009, Hsieh et al. 2010, Fournier et al. 2011, Fournier 2014), and they are critical for maintaining species diversity of these ecosystems (Rogers 1979, 2000; Whalley 1996; Osono et al. 2011). New *Xylaria* species and records have been described after recent investigations on wood-rotting fungi in subtropical and tropical forests in China (Ma et al. 2011, 2012, 2013a,b,c). This paper reports a new species of *Xylaria* based on two specimens on the dead tree stump during a survey of xylariaceous fungi in southern China. They differ morphologically from existing *Xylaria* species, so we describe and illustrate them as a new species.

Materials & methods

Voucher specimens are deposited in the Fungarium of Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou, China (FCATAS). Microscopical features and measurements were determined from tissues mounted in water and Melzer's iodine reagent. The photographs of asci, ascal apical ring, and ascospores were taken using a Keyence VHX-600E microscope, and photographs of the stromatal surface were taken with a S70 Canon camera attached to a ZSA30w microscope.

Taxonomy

Xylaria nelumboniformis Hai X. Ma, Lar.N. Vassiljeva & Yu Li, **sp. nov.** FIGS 1, 2

MYCOBANK MB 817858

Differs from *Xylaria psamathos* by its tomentose stromata, larger ascospores, and short oblique germ slit.

TYPE: China, Hainan Province: Diaoluoshan Natural Reserve, 18°46′N 109°50′E, alt. 500 m, on dead stump, 10 Nov. 2012, Haixia Ma, Col. 16 (**Holotype**, FCATAS 547).

ETYMOLOGY: The epithet refers to the "lotus leaf" shape of the fertile part of the stromata.

STROMATA unbranched, upright, with applanate surface of fertile apices, 4–22 mm tall overall, short or long stipitate; fertile parts 4–10 mm diam. × 1.5–3 mm thick, nearly lotus leaf-shaped to irregularly discoid, externally greyish-black to black, with greyish-white sloughing scales and tomentose, especially on the edges; surface plane or with inconspicuous perithecial mounds, finely cracked and tomentose, internally white, woody, texture hard. Stipes 1.5–18 × 1–1.5 mm, terete, inconspicuously tomentose, sometimes contorted, arising from a slightly enlarged base. Perithecia subglobose, 600–900 µm diam. Ostioles slightly prominent. Asci eight-spored, uniseriate, cylindrical, long-stipitate, (180–)190–240(–260) µm long overall, the spore-bearing parts 150–170 × 9–10 µm, the stipes 30–110 µm long, with apical apparatus bluing in Melzer's reagent, urn-shaped to nearly rectangular, (8–)10–12(–15) × 4–5 µm. Ascospores brown to dark brown, unicellular, ellipsoid-inequilateral to navicular to crescent-shaped, with narrowly to broadly rounded ends, smooth, (21.5–)23–27.5(–31.5) × (7–)7.5–9(–10) µm, with short oblique germ slit.

ADDITIONAL SPECIMEN EXAMINED: **CHINA, HAINAN PROVINCE: Diaoluoshan Natural Reserve,** 18°46′N 109°50′E, alt. 500 m, on dead stump, 12 Jul. 2013, Haixia Ma (FCATAS 612).

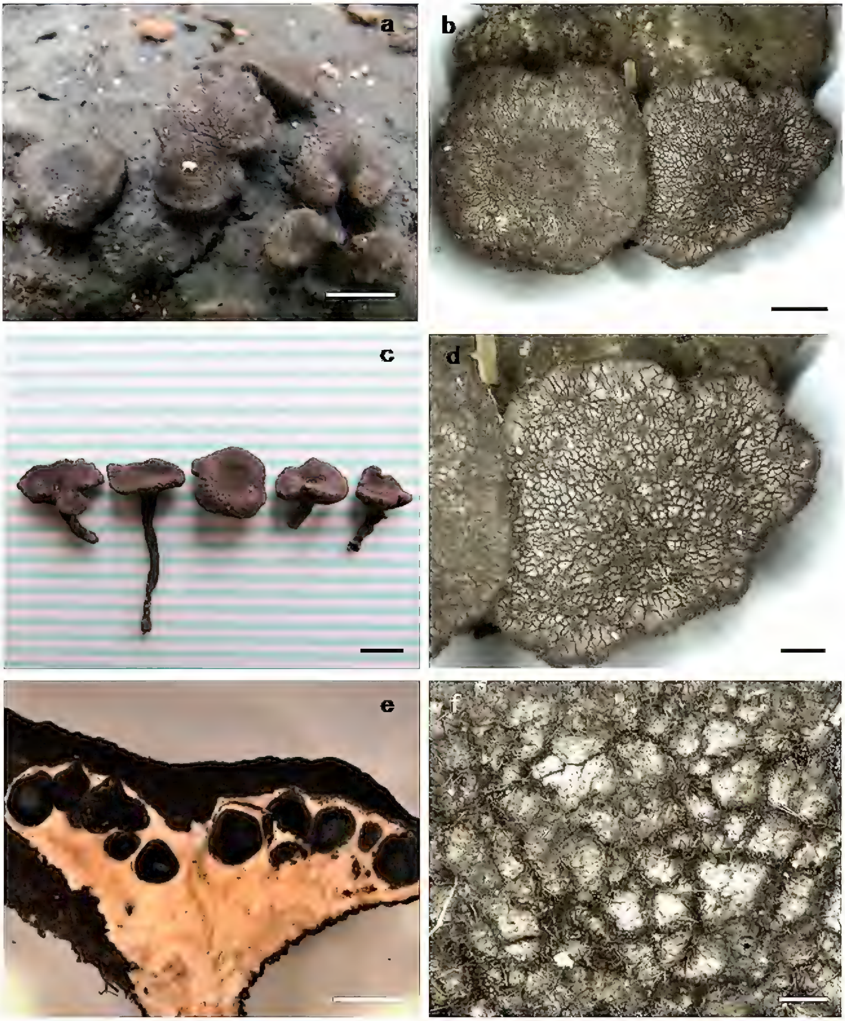

Fig. 1. *Xylaria nelumboniformis* (holotype, FCATAS 547). a–c. Stromata; d, f. Stromatal surface; e. Mature stroma in vertical section. Scale bars: a, c = 6 mm; b = 2 mm; d, e = 1 mm; f = 0.2 mm.

Comments —*Xylaria nelumboniformis* is easily separated from other *Xylaria* species by its lotus-leaf shaped or irregularly discoid flattened stromata that are conspicuously tomentose on the edges. This species is strikingly similar in stromatal morphology to *X. psamathos* Boise, which differs by its smooth

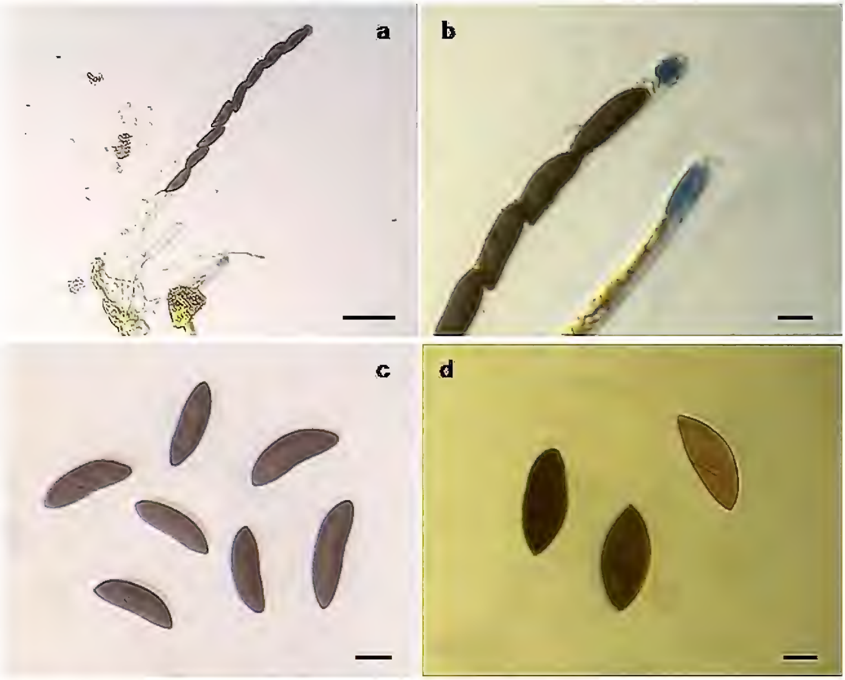

Fig. 2. *Xylaria nelumboniformis* (holotype, FCATAS 547). a. Asci and paraphyses; b. Ascus apical ring; c. Ascospores; d. Germ slit. Scale bars: a = 40 µm; b, c = 10 µm; d = 8 µm.

stromata, its smaller ascospores (11–13 × 4–6 µm) with a straight germ-slit extending the full length of the spore, its flattened-cylindrical ascus rings, and its habitat (dead grass culms in a North Carolina saltmarsh; Boise 1982).

Xylaria nelumboniformis is somewhat similar to *X. crozonensis* P. Leroy & Mornand and *X. michoacana* F. San Martín et al. in stromatal morphology, but *X. crozonensis* has cracked smooth stromata that are narrowly connected to the substrate and smaller ascospores (13.3–15.6 × 7.6–8.8 µm) with a straight inconspicuous germ slit (Leroy & Mornand 2004, Fournier 2014). *Xylaria michoacana* is distinguished by cracked smooth stromata that are narrowly connected to the substrate and slightly smaller subglobose ascospores (21.5–24.5 × 14–16 µm; San Martín et al. 2001).

Acknowledgments

We greatly appreciate Dr. A.J. Whalley of Liverpool John Moores University and Dr. Nian-Kai Zeng of Hainan Medical University for reviewing the presubmission manuscript and giving helpful comments and suggestions. This study was supported by the National Natural Science Foundation of China (no. 31400012) and National Basic Research Priorities Program of China (no. 2013FY110400).

Literature cited

Boise J. 1982. A new graminicolous species of *Xylaria*. Mycologia 74(3): 467–471. http://dx.doi.org/10.2307/3792968

Dennis RWG. 1956. Some xylarias of tropical America. Kew Bulletin 11: 401–444. http://dx.doi.org/10.2307/4109126

Fournier J. 2014. Update on European species of *Xylaria*. https://www.researchgate.net/publication/266020909

Fournier J, Flessa F, Peršoh D & Stadler M. 2011. Three new *Xylaria* species from southwestern Europe. Mycological Progress 10: 33–52. http://dx.doi.org/10.1007/s11557-010-0671-8

Hsieh HM, Lin CR, Fang MJ, Rogers JD, Fournier J, Lechat C, Ju YM. 2010. Phylogenetic status of *Xylaria* subgenus *Pseudoxylaria* among taxa of the subfamily Xylarioideae (*Xylariaceae*) and phylogeny of the taxa involved in the subfamily. Molecular Phylogenetics and Evolution 54: 957–969. http://dx.doi.org/10.1016/j.ympev.2009.12.015

Ju YM & Rogers JD. 1999. The *Xylariaceae* of Taiwan (excluding *Anthostomella*). Mycotaxon 73: 343–440.

Ju Y M, Hsieh H M, Vasilyeva L, Akulov A. 2009. Three new *Xylaria* species from Russian Far East. Mycologia 101: 548–553. http://dx.doi.org/10.3852/08-188

Læssøe T. 1987. *Xylaria corniformis* reconsidered. Mycotaxon 30: 81–85.

Leroy P, Mornand J. 2004. Validation de taxon: *Xylaria crozonensis* Leroy & Mornand, sp. nov. Documents Mycologiques 33(130): 35.

Lonsdale D, Pautasso M, Holdenrieder O. 2008. Wood-decaying fungi in the forest: conservation needs and management options. European Journal of Forest Research 127: 1–22. http://dx.doi.org/10.1007/s10342-007-0182-6

Ma HX, Vasilyeva LN, Li Y. 2011. *Xylaria choui*, a new species from China. Sydowia 63(1): 79–83.

Ma HX, Vasilyeva LN, Li Y. 2012. The genus *Xylaria* in the south of China – 5. Three new records in the China Mainland. Austrian Journal of Mycology 21: 61–67.

Ma HX, Vasilyeva LN, Li Y. 2013a. The genus *Xylaria* in the south of China – 3. *X. atroglbosa* sp. nov. Mycotaxon 119 :381–384. http://dx.doi.org/10.5248/119.381

Ma HX, Vasilyeva LN, Li Y. 2013b. The genus *Xylaria* in the south of China – 4. *X. hemisphaerica* sp. nov. from Yunnan Province. Mycosystema 32(4): 602–605.

Ma HX, Vasilyeva LN, Li Y. 2013c. The genus *Xylaria* (*Xylariaceae*) in the south of China – 6. A new *Xylaria* species based on morphological and molecular characters. Phytotaxa 147(2): 48–54. http://dx.doi.org/10.11646/phytotaxa.147.2.2

Martin PMD. 1970. Studies in the *Xylariaceae*: VIII. *Xylaria* and its allies. South African Journal of Botany 36: 73–137.

Osono T, To-Anun C, Hagiwara Y & Hirose D. 2011. Decomposition of wood, petiole and leaf litter by *Xylaria* species. Fungal Ecology 4: 210–218. http://dx.doi.org/10.1016/j.funeco.2010.11.003

Rogers JD. 1979. The *Xylariaceae:* systematic, biological and evolutionary aspects. Mycologia 71: 1–42. http://dx.doi.org/10.2307/3759218

Rogers JD. 2000. Thoughts and musings on tropical *Xylariaceae*. Mycological Research 104(12): 1412–1420. http://dx.doi.org/10.1017/s0953756200003464

Rogers JD, Callan BE & Samuels GJ. 1987. The *Xylaria* of the rain forests of North Sulawesi (Indonesia). Mycotaxon 29: 113–172.

San Martín F, Lavín P, Rogers JD. 2001. Some species of *Xylaria* (*Hymenoascomycetes*, *Xylariaceae*) associated with oaks in Mexico. Mycotaxon 79: 337–360.

Van der Gucht K. 1995. Illustrations and descriptions of xylariaceous fungi collected in Papua New Guinea. Bulletin du Jardín Botanique National de Belgique 64: 219–403. http://dx.doi.org/10.2307/3668386

Whalley AJS. 1996. The xylariaceous way of life. Mycological Research 100: 897–922. http://dx.doi.org/10.1016/s0953-7562(96)80042-6